REMARKS/ARGUMENTS

Claims 6-13 are pending in this application. The Office Action states that claims 12 and 13 are withdrawn along with claims 1-5 and 14-26. This is believed to be an error. As requested in our Response filed on September 25, 2003, which was accepted by the Examiner, claims 6-13 should be under examination.

Claim Rejection under 35 U.S.C. § 103:

Claims 6-10 are rejected under 35 U.S.C. § 103 as allegedly unpatentable over Weber (WO 95/00540). Applicants respectfully traverse this rejection based on the following.

The present invention is an endotoxin removal adsorbent having a ligand immobilized on a solid phase support medium such as beads. The ligands used in the invention are a mixture of heterogeneous polydisperse oligopeptides composed of amino acids having a pK higher than 7.2. This invention is based on the discovery that a mixture of oligopeptides made by the polycondensation step as illustrated in the Specification exhibit a high degree of polydispersity (i.e., different molecular weights and different number of branches per molecule) and that this high degree of heterogeneity corresponds to the high degree of heterogeneity of endotoxin resulting in a high capacity for removal of a variety of endotoxins from different sources with minimum side effects.

In contrast, Weber describes a synthetic carrier for delivering biologically active components (e.g., immunogens) to an organism. The exemplified synthetic carriers therein are peptides having a terminal amino acid having a pair of functional end sites to which additional amino acids can be attached to form a matrix as shown in Fig.1

Applicants submit that the invention as claimed is not obvious over Weber. The peptides useful for the invention and those described by Weber represent two different compositions useful for two unrelated applications. These unrelated utilities are reflected in their compositions and properties thereof. The oligopeptides of the invention are made to be heterogeneous and polydisperse to maximize the capacity for removing a variety of endotoxins. The peptides of Weber are designed to be pure in order to provide specific end products for a given biological component to be attached at a specific coupling ratio. Accordingly, the peptides disclosed by Weber have a strict structure, i.e. same structure for a given biological component to be attached such that a specific coupling ratio can be achieved (*see* Abstract). Thus, the peptides of Weber do not have polydispersity with respect to both molecular weight and to number of branches per molecule in a given synthetic carrier. By contrast, the oligopeptides of the invention herein have different molecular weights and different number of branches per molecule among them, i.e., they are polydisperse. There is no link between the oligopeptides of the present invention and the peptides disclosed by Weber with respect to the characteristics and the utilities. There is nothing in Weber which suggests that the synthetic carrier peptides disclosed therein are polydisperse with respect to the molecular weight and the number of branches per molecule or that these peptides are useful for removing endotoxins. A person of ordinary skill in the art would not have been motivated to make and use the invention as claimed based on the cited reference.

The Office Action states that Weber does not disclose that the peptides which are formed will be "polydisperse" but they can be polydisperse as alleged in the Office Action. The real issue is whether a person or ordinary skill in the art would have been able to make the present invention based on the teachings of Weber. Applicants assert that nothing in Weber suggests the invention or can motivate one skilled in the art to make and use the invention. As discussed above, the present application and the cited reference describe two different types of peptides useful for different applications. The

peptides by Weber are useful for delivering biologically active components such as immunogenic peptides and cytokines to an organism. It is specifically emphasized therein that the coupling between the end sites of the carrier peptide and the biologically active components be at specific ratios and that this requires the carrier peptides to be of exceptional purity (i.e. one type). This is in good contrast with the peptides of the invention which is a mixture of heterogeneous oligopeptides with respect to both the molecular weight and to the number of branches per molecule, which is a key feature for binding diverse types of endotoxins with high efficiency. There is no mention or suggestion of endotoxin in the cited reference.

The Office Action alleges that the term, "solid phase support" is recited without clear definition. Applicants do not agree. The Specification on page 5, lines 9-20 describes examples of the solid support medium and various ways of coupling the oligopeptides to such medium. The support medium is a porous material such as beads, membranes, particle bed or fiber mat which has porosity sufficient to allow passage of blood therethrough. The oligopeptides can be attached to such support medium using conventional coupling reagents such as cyanuric chloride, carbonyldiimidazole, promcyan, or water-soluble carbodiimide. Applicants submit that the claims are directed to the adsorbents having a mixture of heterogeneous polydisperse oligopeptides immobilized on a solid support medium for removing a variety of endotoxins. The use of the solid phase medium is only one aspect of the invention. The types of the solid support medium useful for the invention are disclosed in the Specification.

In summary, based on the foregoing remarks and arguments, claims 6-10 are not *prima facie* obvious over Weber. Withdrawal of the rejection under 35 U.S.C. § 103 is respectfully requested.

Allowable Subject Matter:

Claims 11-13 appear to be allowable if rewritten by incorporating the limitations of the claims from which they depend.

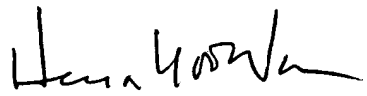
Conclusion

Based on the foregoing amendments and arguments, this application is considered to be in condition for allowance and passage to issuance is respectfully requested.

If there are any remaining issues related to patentability, a telephone interview is requested and the Examiner is invited to call to arrange a mutually convenient time.

It is believed that this submission does not require the payment of any fees. If this is incorrect, however, please charge any requisite fees to Deposit Account No. 07-1969.

Respectfully submitted,



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